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Laws of Nature and Laws of Man

Law is a weighty word of frequent use in every principal field of human interest. There are, for example, the laws of Moses and the laws of motion, the two phrases flowing in parallel as though these laws were similar in origin and authority instead of being poles apart. There are also laws of logic, of language, of art, of heredity, and laws of Congress and of other legislative bodies. As fundamentally different in essential character as various laws may be, the same general substantive is used for all, often with much confusion of thought.

In order to clarify ideas, laws may be divided into two general and quite distinct classes—laws of nature and laws of man. Limited to its essential property, a law of nature is a description of relations among natural phenomena of a class. Such laws are derived from experiments and observations, and they are true and valuable to the extent to which they describe accurately general relations among phenomena, for they group them into comprehensible systems that enable scientists to control, or at least to conform to, the materials and the forces of the world about us. It is by the discovery and the use of natural laws that the unparalleled benefits of applied science have been obtained.

A law of man, on the other hand, is a statute that prescribes what men must do or may not do. It is personal in origin and application and subject to amendment or even reversal, while a law of nature is impersonal and lasting. A law of man is an expression of the will of an exterior authority, while a law of nature is a description of the essential properties of the things to which it pertains. A law of nature abides whatever laws man may make, but a law of man can long endure only if it is in approximate harmony with the laws of nature.

A more comprehensive discussion than can be given in a few short paragraphs would of course point out that the laws of nature are not presented to us in unambiguous terms on tablets of stone but are formulated in minds colored by traditions and superstitions; that they are expressed, at least nontechnically, in language incapable of conveying precise meaning; that at the best they are based on limited evidence and are therefore necessarily incomplete; and that the laws of man also are descriptions of natural phenomena in the complex fields of life. Yet there is a great wall between the orderly gardens in which the scientists' laws of nature blossom and mature and the highways and byways of life where most of the laws of man originate. If the statements given here of the differences between the two classes of laws lack desirable explanations or qualifications, the omissions will be forgiven.

There is a widespread opinion that the laws of nature are severe and inflexible, and that opinion is correct. It is natural to desire exceptions to care for special cases, or even occasionally to wish that a law of nature were somewhat different in order that something that appears advantageous might be possible. For example, for two centuries after refracting telescopes were invented the variation of refraction from color to color, known as *dispersion*, was regarded as unfortunate because it impaired the quality of these miraculous instruments. Yet the dispersion of light is the precise property that makes possible the spectroscope, an instrument that multiplies at least a hundred times the information about the heavens that even a perfect telescope alone could give. It is doubtful that scientists could suggest a change in any law of nature that would not be disadvantageous, or the temporary relaxation of the rigors of any law of nature that would not be certain to do more harm than good. A mother seeing her child falling to its death might pray that gravity be temporarily suspended; but if her prayer were answered the

whole earth would quickly break up because of its rotation.

Among the laws of man there have been certain ones that have been relatively permanent. They are the basic principles that are crystallized in constitutions, or in the Common Law that is imbedded even more firmly in the hearts of stable peoples. Perhaps instead of advocating special political means of ameliorating the world's woes, scientists might do better at present to emphasize the advantages of basic principles in human government, as well as in science, that may be changed only by the operation of elaborate and all-embracing political machinery. In the name of emergencies and by such pleasing sayings as that laws are made for man and not man for laws, it would be possible, for example, for courts, by long sequences of gradually changing decisions, to sign our Bill of Rights away. The Oriental is reputed to save his face by maintaining the form, if not the substance, of authority. Now, when the foam of rapidly changing world events obscures the deep currents of human history, let us not make the fatal error of saving our face by specious arguments in special cases while the foundations of our liberties gradually erode away. Many nations have learned that it is not through "blood and sweat and tears" that a people degenerates and sinks into oblivion, but that it is the pleasant, rainbow-arched paths of irresponsibility that lead through the sunset into the night.

It is a fully justified tradition that the farmers of America have always defended and preserved its liberties. They have faced hardships and dangers without flinching, endured the discipline of toil, reaped the rewards of industry, learned the advantages of cooperation with their neighbors, and enjoyed the satisfaction of making two blades of grass grow where but one grew before. Their bare feet have pressed the cool earth, they have walked uncovered in the gentle rain, they have watched the flight of migratory birds in spring, they have turned their eyes in wonder to the cloudless skies at night; they have been the salt of the earth, and an appreciative country has called many of them to high places. But now, for more than a generation and at a constantly accelerating rate, the applications of science, primarily, and a benevolent government, secondarily, have placed within their easy reach the four freedoms and a hundred other advantages that were undreamed of only two generations ago. It was expected that these richly deserved advantages would prove to be only beneficial, yet something not easily defined but very precious has been dying in our land, and there is no likelihood that time will reverse itself and bring it to life again.

But another host has been developing in rapidly increasing numbers, a new and equally adventurous kind of pioneers, men and women who also know the satisfactions of toil, the advantages of altruism, the joys of scouting frontiers, the elations of discovery, the inspirations of standing on lofty scientific eminences and surveying the whole history of the earth and of the myriad forms of life that have had it for their home. The laws of nature they are discovering and formulating are the solid foundations beneath their feet, the world is their country and to guide it toward harmony with the eternal verities they are gradually learning is their religion. They have no illusions that the millenium is near at hand. Instead they enthusiastically face the arduous and joyful task of undertaking to provide a new moral leadership for mankind at the most fluid and favorable period in the whole history of the world.—F.R.M.

Isaiah Bowman, President of the Association

Dr. Isaiah Bowman, President of The Johns Hopkins University, was elected President of the Association by the Council on its third mail ballot. In addition, in the informal ballot of the general membership of the Association. he received 531 votes. His election is a perfect example of the democratic process in operation among scientists.

It would be easy to fill a column with lists of Dr. Bowman's achievements and honors, but his election as President of the Association is sufficient evidence that they are known in a general way by the members. It is not necessary to emphasize the fact that the Association is honored by his election and his acceptance of the office. Nor is it necessary to remark that he has been elected to an office that has been held by many of the greatest scientists America has produced —his predecessors for the past two years, Drs. Irving Langmuir and Arthur H. Compton, both received Nobel prizes.

What is enormously more important than such considerations, both for the Association and for Dr. Bowman, is that he is the right man in the right place at the right time. He has had enormous experience in surveying the natural and human resources of the earth. Governments have listened and are now listening to his counsels. His administrative experience has been broad. In him is combined to an exceptional

degree a knowledge of science and of the complex problems of human relations.

For more than 90 years the voice of the Association has been the general voice of American science. Its large membership and the wide diversity of its interests give balance and weight to its words. Its responsibilities for the future of both science and civilization are heavy, for the present appears to be a critical period in the world's history in which, for a time, the paths to widely different futures lie close to one another. The man, the place, the opportunity! May Dr. Bowman have knowledge and wisdom and inspiration! May the Association be worthy of his leadership!—F.R.M.

Resolution on Interrelations Among Scientists of the Western Hemisphere

Four special committees were appointed by the Executive Committee of the Association on January 17 to prepare resolutions on subjects of high current interest and importance. The report of the first committee, consisting of Dr. Walter B. Cannon and Dr. Chauncey D. Leake, has been completed and is being submitted to the Council for its consideration and probable approval. The subject of the resolution is of such importance for the future of science in the Western Hemisphere that all members of the Association are invited to express their opinions upon the interrelations among scientists of our Western World and upon the resolution that is here presented. Their responses will be summarized in a future issue of the BULLETIN.

Dr. Cannon is emeritus professor of physiology at Harvard Medical School. He has received honorary degrees from Harvard, Yale, Washington, Boston, Liége, Strasbourg and Paris. He has been the Croonian lecturer at the Royal Society of London, exchange professor at the Sorbonne and École de Médecin of Paris, Linacre lecturer at Cambridge (England), visiting professor at Peiping Union Medical College, and is a member of the board of scientific directors of the Rockefeller Institute for Medical Research.

Dr. Cannon has been a member of the National Academy of Sciences since 1914 and he is a member or an honorary member of so many other American and foreign scientific societies, including several in South America, that space cannot be taken to enumerate them. As to his connection with the Association, he became a member in 1904, was elected a fellow in 1906, and President in 1939. He is now serving his fourth year as a member of the Executive Committee.

Dr. Leake, a native of New Jersey, took his undergraduate work at Princeton, his Ph.D. at Wisconsin in 1923, following which he was assistant and associate professor of pharmacology at that institution until 1928, when he became a professor in the University of California Medical School and continued until he was elected dean of the medical school of the University of Texas at Galveston last year. As to his connection with the Association, Dr. Leake became a member in 1929, was appointed a member of the committee on the Theobald Smith Award in 1935, serving two four-year terms, was elected a fellow in 1931 and Vice President for the Section on Historical and Philological Sciences in 1940.

The Resolution

The American Association for the Advancement of Science, an organization having more than 24,000 members and including broadly both the natural and the social sciences, sends cordial greetings to scientists and scientific workers throughout the Western Hemisphere. Because of the unity of purpose among scientific workers they exemplify a great fraternity. And because that fraternity is widely dispersed it may help to establish deeper understanding and confidence among the peoples it represents.

In devotion to the search for knowledge and wisdom scientists are not separated from one another by divisive national boundaries. What they seek may be discovered in any land and they place their findings in the service of all. The nations of the New World, all relatively young in scientific activities, have in the past looked to the European nations for inspiration and for technical discipline in productive scholarship. Now that the European peoples are tragically estranged as they engage in a devastating war or are suffering subjugation, resort to them is not possible. The time is opportune for scientists in the nations of the Western Hemisphere to take upon themselves an obligation implied in what they have received in the past. Insofar as the war effort in the various countries of the Americas will permit, the task of realizing the deep significance of scientific research for human welfare should be assumed. Leadership in scholarly endeavor is now imposed on the younger countries of the West. And by intellectual intercourse they can illustrate the interdependence of scientific workers, and later, at a happier time, they may lead in reestablishing the cooperative activities which are characteristic of the scientific spirit. These are projects reasonable to undertake. The friendly relations among American countries are conducive to mutual esteem and understanding. The barriers raised by language differences can be simply surmounted by the scientists of any nation because learning a single foreign tongue is practically sufficient. In these favorable circumstances men of science in North and South America should not find it difficult to keep aflame the lamp of learning while it flickers or dims out elsewhere.

The implications of the scientific spirit for the future benefit of all peoples are becoming increasingly evident. Even the moral consequences of scientific understanding are now recognized and appreciated. Objectively demonstrable knowledge about ourselves and our environment, voluntarily accepted, is the solid foundation for substantial faith in a brighter future. Science thrives in freedom. Fully justified now is the confidence that science can contribute mightily through social collaboration, to common human needs—freedom from want, freedom from fear, freedom from toilsome drudgery and oppression.

The American Association for the Advancement of Science expresses the hope, therefore, that more and more the solidarity of scientific investigators will be recognized in the nations of the Western Hemisphere and that cooperative undertakings will be promoted—in the exchange of publications, in the continued exchange of students and teachers, and, when effective, in the conduct of research. There are incalculable benefits, both intellectual and material, which will surely be bestowed upon the peoples of the meridional nations of the West by the progress of scientific knowledge and by its application to the abundant resources of the Hemisphere. Advantage to all will result from the establishment and strengthening of the bonds of fellowship and sympathetic appreciation among the scientific workers in North and South America. Toward that goal the Association cordially offers and invites generous collaboration.

More About "Knowledge and Wisdom"

"Knowledge and Wisdom, far from being one,
Have oft-times no connexion. Knowledge dwells
In heads replete with thoughts of other men;
Wisdom in minds attentive to their own.
Knowledge is proud that he has learned so much;
Wisdom is humble that he knows no more."
—Cowper, as reported by W. D. V. (botanist) and H. A. (linguist).

"The conclusion of your interesting article in the recent BULLETIN is not correct. So far as we know the "wisdom" of the body parts is uniform throughout."—B. W. W. (botanist).

"The last editorial is a gem. I shall read it to my class."—E. K. (mathematician).

"I don't think you pushed too far the analogy between the wisdom of the body and of the mind. . . . If schools and colleges would turn to teaching *wisdom* in addition to knowledge, perhaps society and our democracy would be much improved."—W. B. C. (physiologist).

"They call him the wisest man to whose mind that which is required at once occurs."—Cicero.

"Wisdom is only found in truth."—Goethe.

"Not by years but by disposition is wisdom acquired."—Plautus.

"Wisdom is the principal thing; therefore get wisdom; and with all thy getting get understanding."—Proverbs.

"To consider the 'constancy of body temperature' as an acquisition, in time, is not WISDOM—to me it is a joke."—Rev. H. R.

"Wisdom cometh by suffering."—Aeschylus.

"Go where he will, the wise man is at home;
His hearth the earth—his hall the azure dome."
—Emerson.

"O world, thou choosest not the better part!
It is not wisdom to be only wise,
And on the inward wisdom close the eyes,
But it is wisdom to believe the heart."
—Santayana.

Dr. Sidney C. Madden Receives the Theobald Smith Award for 1943

The Association awards two prizes each year, "The Thousand Dollar Prize" provided by an anonymous friend of the Association for a paper of high importance presented before a scientific session at the annual meeting, and the "Theobald Smith Award," provided by Eli Lilly and Company, of Indianapolis, Ind., for a distinguished contribution to medical science by a person under 35 years of age.

The Thousand Dollar Prize has been awarded annually since 1923 until this year when the cancellation of the scheduled New York Meeting made it necessary to omit it. Since the Theobald Smith Award is for a distinguished contribution to science whether or not the recipient presents a paper at a meeting of the Association, it has been awarded as usual. Beginning with the establishment of the Theobald Smith Award in 1937, the names of those who have received the Award and the subjects of the work for which they were given it are as follows:

1937	Dr. Robley D. Evans, Radium Poisoning
1938	Dr. Charles F. Code, Histamine in the Blood
1939	Dr. Albert B. Sabin, Constitutional Barriers to Involvement of the Nervous System by Certain Viruses
1940	Dr. Herald R. Cox, Cultivation of Rickettsiae of the Rocky Mountain Spotted Fever
1941	No award
1942	No award

Dr. Sidney C. Madden, of the University of Rochester School of Medicine and Dentistry and Strong Memorial Hospital, received the Theobald Smith Award for this year for his distinguished work on plasma proteins on which he will report before the Section on Medical Sciences of the Association at its next meeting.

The original gift from Eli Lilly and Company for the Theobald Smith Award was for a period of five years, expiring this year. The interest in the Award has been so great and the researches by young scientists for which it has been given have been of such high order of merit that Eli Lilly and Company have notified the Association of their intention to continue the Award for at least three years.

The 137 Societies Affiliated with the Association

Organized American science has developed at such an amazing rate during the past 40 years that only brief surveys can give any real conception of what scientists have accomplished. For this reason the BULLETIN will publish short factual and statistical reviews of the 137 scientific societies that are affiliated with the Association. It is expected that they will be amplified somewhat and included in the next volume of the Summarized Proceedings of the Association as a permanent record of a remarkable period in American science.

The surveys which will be presented will give rise to many reflections, for they will unfold an inspiring story of unparalleled accomplishments due entirely to individual initiative and tireless devotion to the ideals of science. They will remind scientists that a bill is now before Congress (the Kilgore-Patman Bill) that has for its purpose to place *all* of American science under the control of a political "National Scientific and Technical Board" headed by the "Administrator and consisting of representatives of industry, labor, agriculture groups and *two persons who are primarily scientists*" (italics added). With the record of accomplishment of the 137 affiliated societies before them, scientists and other high-minded men who may read these surveys will demand with one voice that politics refrain from putting its paralyzing hands on the most competent, altruistic, and efficient forces that are serving civilization in this country.

There will be reflections, too, on the future of science. During the period that will be covered by the survey many groups with interests in limited parts of their general fields have organized separate societies which have been supported with devotion and have generally attained high success. There are distinct advantages in specialization, and also in integration. Probably in the future more attention will be given to the general strategy of science both in exploring new fields and in making scientific work useful to society. The problems of making available scientific literature to scientists, and to the general public as well, are ones that will receive greatly increased attention. But why conjecture? If the past is a guide, the wildest dreams of science at present will be far surpassed by the realities of tomorrow.

The first survey will be that of the American Chemical Society which was one of the first group of societies that became affiliated with the Association. Its remarkable record will be an inspiration to all scientists.—F.R.M.

The American Chemical Society

In April 1876, 35 chemists met in New York City for the purpose of forming an American chemical society. The first published list of members included 133 names. The first national meeting was held at Newport, R. I., on August 6 and 7, 1890, with 43 chemists in attendance. From these beginnings the American Chemical Society today has become the world's largest body devoted to a single science. Its membership numbers about 34,000 and it has just held its 105th national meeting. Originally the Society was incorporated in New York State. By Act No. 358, 75th Congress, 1st Session, it was given a national charter with the approval and aid of five of the Departments represented in the Cabinet.

The objects of the Society as detailed in its Constitution are "to encourage in the broadest and most liberal manner the advancement of chemistry in all its branches; the promotion of research in chemical science and industry; the improvement of the qualifications and usefulness of chemists through high standards of professional ethics, education, and attainments; the increase and diffusion of chemical knowledge; and by its meetings, professional contacts, reports, papers, discussions, and publications, to promote scientific interests and inquiry, thereby fostering public welfare and education, aiding the development of our country's industries, and adding to the material prosperity and happiness of our people."

The Act of Incorporation provides "That the American Chemical Society shall whenever called upon by the War or Navy Department investigate, examine, experiment, and report upon any subject in pure or applied chemistry connected with the national defense, the actual expense of such investigations, examinations, experiments, and reports to be paid from appropriations which may have been made for that purpose by Congress, but the society shall receive no compen-

sation whatever for any services to the Government of the United States: Provided, That the title to any and all inventions and discoveries made in the course of such investigations, examinations, and experiments that, in the opinion of the Secretary of the Navy or the Secretary of War, involve the national defense, shall vest in the Government of the United States, and the Government of the United States shall have unlimited license under all other inventions and discoveries."

The Society has 18 technical divisions—Agricultural and Food Chemistry; Analytical and Micro Chemistry; Biological Chemistry; Cellulose Chemistry; Chemical Education; Colloid Chemistry; Fertilizer Chemistry; Gas and Fuel Chemistry; the History of Chemistry; Industrial and Engineering Chemistry; Medicinal Chemistry; Organic Chemistry; Paint, Varnish, and Plastics Chemistry; Petroleum Chemistry; Physical and Inorganic Chemistry; Rubber Chemistry; Sugar Chemistry and Technology; and Water, Sewage, and Sanitation Chemistry.

Two national meetings of the American Chemical Society are held annually. Most of the divisions hold sessions at each of these meetings, providing between 400 and 500 technical papers.

There are 99 local sections in 43 states, one territory, and the District of Columbia. Most of them meet monthly. The largest section has 2,912 members and the next largest 2,053; 3 have between 1,000 and 2,000 members, 10 between 500 and 1,000, 7 between 300 and 500, 14 between 200 and 300, 20 between 100 and 200, 24 between 50 and 100 and 19 between 20 and 50.

The growth of the Society has been as follows:

1886	241	1926	14,704
1896	1,111	1936	18,727
1906	3,079	1942	31,717
1916	8,355 (Apr. 1)	1943	34,000

In carrying out its objects, the Society engages in many varied activities. Its publication program is the most extensive chemical publishing effort in the world. The Society publishes the *Journal of the American Chemical Society* (Vol. 65),* *Chemical Abstracts* (Vol. 37), *Industrial and Engineering Chemistry* [Industrial Edition (Vol. 35) and Analytical Edition (Vol. 15)], and *Chemical and Engineering News* (Vol. 21). It owns and edits the *Journal of Physical Chemistry* (Vol. 47) and *Chemical Reviews* (Vol. 32). The Society has edited and its agents have published 88 authoritative monographs. Its Division of Chemical Education owns and edits the *Journal of Chemical Education* (Vol. 20) and the Division of Rubber Chemistry publishes *Rubber Chemistry and Technology* (Vol. 16). Most of the pages in these journals now are used to present information required by the chemists and chemical engineers engaged in vital war work. For example, all patents, articles, reports, and books of chemical interest published anywhere in the world are reviewed briefly in *Chemical Abstracts*, indexed annually and decennially by authors, subjects, chemical formulae, and patent numbers. To obtain this material, 400 abstractors systematically examine over 4,000 periodicals printed in 31 different languages. Even now, the foreign material is being secured, although with difficulty. The resulting publication is so essential to all war industries that each new plant and laboratory attempts to obtain a complete set. The other publications, each in its own field, are of similarly vital importance in the war effort. Heads of many war agencies have attested to this.

* 1943 volume numbers given.

Chemists and chemical engineers are essential for the development and production of virtually all war material. The necessary training for the profession requires from four to seven years full time. Surveys conducted by the Society in 1942 showed that the supply of trained chemists was adequate for a peace-time industry but that it would be impossible fully to meet war demands. Therefore, the Society has been working closely with officials of the Selective Service and other Government agencies to see that chemical manpower is used more effectively. Members of the profession in less-essential industries have been assisted in entering war production or research and qualified men have been found for important war positions in the Government and private industry.

The American Chemical Society was responsible for the formation of the Chemical Warfare Service in World War I. It has maintained an active Advisory Committee to that Service and has supplied many chemical specialists for duty in the present emergency. Another committee is advising the National Defense Research Committee on chemical matters. At a request from the Executive Office of the President, the Society undertook in cooperation with the National Roster of Scientific and Specialized Personnel a comprehensive census of American chemists and chemical engineers.

Several of the long-time programs of this organization have paid dividends in the emergency. Ever since its organization, the Society in innumerable ways has encouraged and aided the growth of the chemical industry. It has contributed greatly to the better preparation of men and women for the profession. When the war created demands for huge industrial expansion and even for new chemical industries, such as synthetic rubber, the chemist, the chemical engineer, the executives, and the entire chemical industry were ready. The Society is justifiably proud of these accomplishments and of its contribution thereto.

A News Service is maintained for dissemination of accurate chemical information to the public. The Society is vitally concerned with the well-being of the chemist. It attempts to make him merit confidence and to obtain the recognition deserved. Standard analytical procedures, reagents, and apparatus receive continuing study. Its complete program cannot be detailed in a brief summary.

The Constitution of the Society provides that the organization "shall consist of Members, Junior Members, Life Members, Honorary Members and Corporation Members." Ninety-four per cent of the member-

ship falls in the first two categories for which annual dues are $9. Any member in good standing may become a life member on payment at one time of $500; he is exempt from payment of annual dues. Honorary members, of which there are at present only five, are exempt from payment of dues. Corporation members pay $25 annually. The Bylaws provide that "Members of the Society for 35 continuous years or over and (1) who are retired from active business, teaching, or other professional activity, or (2) who are over 70 years of age, are eligible for emeritus status." Such members pay no dues. Any regularly matriculated student majoring in chemistry or chemical engineering is given a discount of one-third of his membership dues provided he subscribes for one or more of the Society's journals.

The American Chemical Society receives its income from (a) membership dues, (b) journal subscriptions, (c) interest on investments, and (d) advertising. Expenditures in 1942 were $768,339.28. For every $1.00 paid by members in 1941, service costing $1.40 was returned.

At present the Society is administering the following awards:

(1) Priestley Medal (triennial)
(2) American Chemical Society Award in Pure Chemistry (funds supplied by Alpha Chi Sigma) (annual)
(3) Borden Award in the Chemistry of Milk (annual)
(4) Eli Lilly and Company Award in Biological Chemistry (annual)
(5) Women's Award in Chemistry (Garvan Medal).

Several of its local sections sponsor awards varying from memberships for outstanding students to medals of international recognition.—CHARLES L. PARSONS, Secretary, American Chemical Society.

Changes in Mailing Addresses

Since October 1, 1942, the Office of the Permanent Secretary has received approximately 4,000 requests from members to change their mailing addresses in the Association's records. For a membership of approximately 24,300, this number (16%) may seem extremely high. During this period, however, by far the largest number of the changes in address were made for those who were entering the armed services or for those from colleges and universities who were accepting positions connected with the war effort. Unlike previous years, few changes were made for members from temporary summer addresses to addresses of permanent residence. This situation was undoubtedly due to curtailment in the use of automobiles and to crowded conditions in rail transportation.

Fortunately, despite the unusually large number of requests for changes of addresses, there have been comparatively few that resulted in unclaimed mail, and perhaps these, in most instances, were caused by incomplete addresses or by orders to move quickly to another location before the details of the original request could be completed. When unclaimed mail is returned to the Office of the Permanent Secretary all available means of tracing are promptly used to find the address of the temporarily lost member. If he can not be located, his name is carried on the membership roll for two years following the year for which his last dues were paid, as in the case of a member who allows his dues to lapse.

The point to be emphasized here is the importance of notifying the Office of the Permanent Secretary of an intended change of address, at least two weeks in advance, if that is possible. As soon as the request is received, the change of address is made on the addressograph plate and coincidentally in the master file and in other membership records when necessary, and the printers of the journals are promptly advised of the change in address for the mailing lists of the BULLETIN and of either *Science* or the *Scientific Monthly*. As a check on the accuracy in making changes, the member receives a postal card bearing his new address made from the addressograph plate and is asked for a prompt reply if an error has been made.

Vice President for Section M

In the list of vice presidents of the Association for 1943 which appeared in the March issue of the BULLETIN, the name of Dr. Thorndike Saville of New York University, Vice President for the Section on Engineering (M), was accidentally omitted. The editors apologize for this unfortunate omission.

Dr. Saville became a member in 1931 and was elected a fellow in 1932. He succeeds Dean W. R. Woolrich of the University of Texas.

A New Publication

At the meeting held in Durham, N. H., on June 23 to 28, 1941, a symposium on Laboratory Procedures in Studies of the Chemical Control of Insects was organized by the American Association of Economic Entomologists, an affiliated society. Most of the papers presented are included in a volume bearing the same title. In addition, supplementary contributions to the principal papers have been prepared in written form since the time of the meeting. As completed, the volume will consist of an introduction, 12 principal scientific papers and 41 supple-

mentary contributions. The references cited, about 450 in number, are to be placed together in a bibliography, and the book closes with two alphabetical indexes, one based on the scientific names of all the species of insects mentioned and the other upon their common names.

The prepublication price of the volume is $3.00 to members and $3.50 to nonmembers; after publication, the prices will be $3.50 and $4.00 respectively.

The Genetics of Pathogenic Organisms

If the proper study of mankind is man, the proper study of all higher plants and animals would be the various species themselves. But recently it has become clear that many of the most fundamental problems of biology, even those pertaining to higher plants and animals, can be most effectively attacked on the plane of the lower organisms. Certainly no problem is more important than that of genetics. Whether a human or a protozoan, a tree or a bacterium, it is believed to be its genes that determine its characteristics and the nature of its offspring. Moreover, the law of transmission of genes from one generation to the next is probably essentially the same in all forms, except for differences due to two parents instead of one.

It is therefore advantageous to investigate the general subject of genetics in low forms in which a thousand successive generations can be followed instead of only a few. Fortunately some of these organisms descend from two parents and others from one. Moreover, some simple living units, such as certain kinds of viruses and bacteria and rusts of wheat, consist of large numbers of strains, from one to another of which it seems probable that mutations are most likely to occur and be observed. Although in many cases different strains of an organism are morphologically indistinguishable from one another and not separable by chemical means, such as staining, their pathogenicity to their hosts are often so amazingly specific and marked that they can easily be identified and followed. It is for this reason that *pathogenic* organisms are much more advantageous in genetical investigations than are those which live upon their hosts without producing serious effects. And the specificity of microorganism to host emphasizes the importance of the whole question of environment, the effects of which are a part of the problem of variation.

Perhaps in the practical results obtained in breeding farm crops that are resistant to viruses and rusts and other pathogenic organisms, scientists have prepared the way for investigations that in the long run will be even more important than protecting our food, for in this work they have opened new approaches to the great problem of inheritance and evolution. Man is naturally more interested in his own species than in any other and looks anxiously to its future. It now appears that he is most likely to learn the essentials of his own physical being, including the principles by which he may eventually direct his own evolution, from the study of low pathogenic forms of life of which he was until fairly recently quite ignorant and the existence of which he even yet generally regards as a misfortune without one compensating advantage.—From the Foreword of the Association's symposium on The Genetics of Pathogenic Organisms. 90 pages, quarto, illustrated, 11 contributors, cloth bound. To members, $2.00.

Officers of the Association

President, Isaiah Bowman; *Permanent Secretary,* Forest R. Moulton; *General Secretary,* Otis W. Caldwell; *Treasurer,* C. Carroll Morgan; *Assistant Secretary,* Sam Woodley.

Executive Committee: Burton E. Livingston, *Chairman;* Roger Adams, Joseph W. Barker, Isaiah Bowman, Otis W. Caldwell, Walter B. Cannon, J. McKeen Cattell, Roy E. Clausen, Kirtley F. Mather, F. R. Moulton, and W. E. Wrather.

Membership in the Association

According to the Constitution, the objects of the Association are to promote intercourse among those who are cultivating science in different parts of America, to cooperate with other scientific societies and institutions, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness. Members may reside in any country. A person desiring to become a member of the Association should fill in a membership application card that may be obtained from the Office of the Permanent Secretary and return it with his payment of $5.00 for one year's dues. Every member in good standing receives with his membership a subscription for either *Science* or *The Scientific Monthly.* Dues are for the fiscal year that begins October 1; the subscription begins the following calendar year. A member desiring to receive both journals concurrently may do so by paying $3.00 in addition to the regular dues. Members in good standing receive also, without extra charge, subscriptions for the A.A.A.S. Bulletin, and they may purchase symposia publications at prepublication prices, and after publication at special prices to members.

A person who pays $100 during one fiscal year may be elected a life member; sustaining members pay $1,000. Both classes are exempt from the payment of further dues but are entitled to all the privileges of membership.

An incorporated scientific society or institution or a public or incorporated library may become a member by paying the entrance fee of $5.00 in addition to the dues. Such institution members are entitled to the same privileges as individual members.

Members are encouraged to nominate for membership persons who desire to cooperate in carrying out the objects of the Association. Names may be sent to the Office of the Permanent Secretary at any time. In the letter of invitation to become a member of the Association the name of the person making the nomination is ordinarily mentioned.

Changes of Address

New addresses for the Association's record and for mailing the journals *Science* and *The Scientific Monthly,* as well as the A.A.A.S. Bulletin, should be in the Office of the Permanent Secretary, Washington, D. C., at least two weeks in advance of the date when the change is to become effective.